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THE MANUFACTURING EXTENSION PARTNERSHIP

## Delivering Measurable Results to Its Clients

Fiscal Year 2005 Results

JANUARY 2007

**NIST**

**National Institute of Standards and Technology**  
Technology Administration, U.S. Department of Commerce

## EXECUTIVE SUMMARY

Created in 1988, the Hollings Manufacturing Extension Partnership (MEP), a program of the U.S. Department of Commerce's National Institute of Standards and Technology (NIST) provides knowledge and problem-solving services to improve the productivity, economic competitiveness and technological capabilities of America's manufacturers, particularly small manufacturers. MEP is a results-based system of locally operated, and staffed non-profit and university-based organizations leveraging federal, state and local, and private resources. This partnership among the federal government, state and local governments, and the private sector has manufacturing extension offices providing a range of needed services to manufacturers across the country and in Puerto Rico. These organizations provide critical services and assistance to meet clients' current and future strategic needs. MEP delivers its services on the shop floors of manufacturing firms and works directly with these firms to provide expertise and services tailored to their most important needs.

Since 1996, NIST MEP has used an independent third party organization to conduct a national survey of center clients. The survey collects client level data on the business impact of the services provided by their local center. These results allow the NIST MEP to gauge the impact of the MEP network on America's manufacturers and its economic impact on the national, state, and regional economies. Clients are surveyed one year after an initial project is completed.

Each year the MEP network helps thousands of client companies solve problems, increase productivity, improve their economic competitiveness, and enhance their technological capabilities. As a result, MEP clients achieve higher profits, save time and money, invest in physical and human capital, and create and retain thousands of jobs. This brief report documents the survey process and summarizes the total national client impacts for the services provided in Fiscal Year 2005. Since the survey is conducted one year after the completion of services, survey results reported here were collected during Fiscal Year 2006. The MEP clients reported that the services led to:

- Improving productivity among eight in ten MEP clients;
- Creating and retaining over 53 thousand jobs;
- Helping firms increase and retain sales of nearly \$6.3 billion;
- Leveraging over \$2.2 billion in new private sector investment; and,
- Generating cost savings of just over \$1.3 billion

MEP clients also reported that:

- 95% were either satisfied or very satisfied with the quality of services received;
- 87% were more competitive as a result of services;
- 87% took actions more quickly with assistance of its local center;
- 77% of clients improved employee skills;
- 77% took actions at a lower cost; and
- 73% improved the work environment for employees.

## THE MANUFACTURING EXTENSION PARTNERSHIP

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## I. INTRODUCTION

### A. The Manufacturing Extension Partnership

Created in 1988, the Manufacturing Extension Partnership (MEP), a program of the U.S. Department of Commerce's National Institute of Standards and Technology (NIST), provides knowledge and problem-solving services to improve the productivity, economic competitiveness and technological capabilities of America's manufacturers, particularly small manufacturers. MEP is a results-based system of locally operated, and staffed non-profit and university-based organizations, leveraging federal, state and local, and private resources. These centers tailor their services to the communities and manufacturers they work with and provide critical services to meet clients' current and future strategic needs.

This partnership among the federal government, state and local governments, and the private sector has manufacturing extension offices in all 50 states and in Puerto Rico. The MEP network is dynamic and constantly evolving, in terms of services provided, the resources the use to support their work, and the manufacturers they serve. MEP delivers its services on the shop floor of manufacturing firms. Centers work directly with local firms to provide expertise and services tailored to firms' most critical needs, ranging from process improvements, product development and employee training, to adopting new business practices and the application of information technology. MEP services are provided through a combination of direct assistance from center staff and assistance from private sector consultants. This diversity is strength, and permits local MEP Centers to provide a wide range of mission-related services tailored to the state and regional economies they serve.

Driven by evolving customer and market demands, MEP constantly refines and improves its products,

services and service-delivery approaches. MEP's work with its clients focuses on technology, innovation, training, and technical assistance.

Since the program began, clients have used the NIST MEP program more than 330,000 times. In Fiscal Year 2005, MEP centers assisted over 16,400 clients in areas including business systems, human resource management, process improvement, product development and market development.

### B. Small Manufacturers and Their Challenges

MEP's primary clients, the more than 341,000 U.S. small manufacturing establishments (with fewer than 500 employees) are important cornerstones of the U.S. economy and are important contributors to national and economic security.<sup>1</sup> Diversity, geographic dispersion and complexity characterize the small manufacturing marketplace. Small manufacturing establishments are a critical national economic resource as reported by the U.S. Census Bureau: in 2002, they represent nearly 99 percent of all manufacturing establishments, account for 70 percent of all manufacturing employment, employ over 10.2 million people, and account for about 57 percent of the total value-added by all U.S. manufacturers.<sup>2</sup>

Critical as they are to the national economy, smaller manufacturers are less likely than larger firms to implement new technology, to adopt modern manufacturing processes, invest in worker training, adopt new forms of work organization, and to deploy improved business practices. Lacking the information

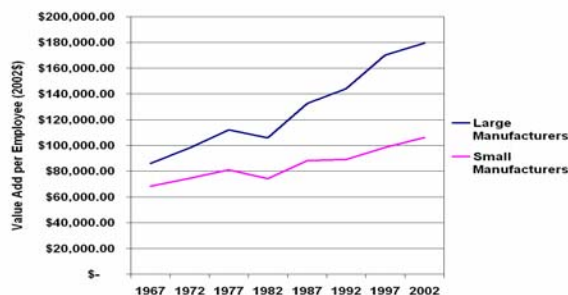
<sup>1</sup> The number of small manufacturing establishments is from the 2004 County Business Patterns data series. For additional information on the challenges confronting small manufacturing firms, see The Manufacturing Institute, the National Association of Manufacturers and RSM McGladrey, Inc. The Future Success of Small and Medium Manufacturers: Challenges and Policy Issues. 2006.

<sup>2</sup> These data are drawn from the 2002 Economic Census: Manufacturing (October 2005).

networks, technical skills, and resources available to large firms, the productivity gap between small and large manufacturers has grown over time (See Figure 1).

**Figure 1**

**The Productivity Gap Between Small and Large Manufacturing Establishments is Growing, 1967-2002**



Source: *Census of Manufacturers, U.S. Census Bureau*

The relationship between large and small firms is becoming more complementary and cooperative rather than competitive. As large firms increase their dependence on suppliers for parts and services, the performance and capabilities of small manufacturers is even more important to the competitiveness of all manufacturers and to the health of the U.S. economy. Further, large manufacturers are requiring small firms within their supply chains to meet increasingly rigorous quality standards, to reduce costs, and become sources of innovation. Failure to comply with these requirements can prevent small firms from surviving in these important product markets.

## II. THE MEP SURVEY

### A. Survey Purpose

Since 1996, NIST MEP has sponsored a national survey of center clients by independent survey experts. The survey asks clients to report on the business impact of the services provided by their local center. NIST MEP surveys center clients for two primary purposes:

- To collect aggregate information on program performance indicators to report to various stakeholders on program performance. The survey

provides information about the quantifiable impacts that clients attribute to the services provided by MEP centers. NIST MEP also conducts other episodic studies to evaluate the system's impact that corroborate and complement the survey results.

- To provide center-specific program performance and impact information for center use. Centers use this information to communicate results to their own stakeholders, at both the state and federal level. Center management and NIST MEP use these results to evaluate center performance and effectiveness. The MEP Center Review Criteria and review process place a strong emphasis on a center's ability to demonstrate impacts based on the survey results.

The survey results also provide MEP centers with a tool to measure their center's performance and effectiveness as well as benchmark their performance against other centers and performance standards. In addition, the data allow NIST MEP to gauge the impact of the national MEP system on America's manufacturers and its impact on the national and regional economies.

### B. Survey Methods

Synovate Inc., a subsidiary of Aegis Group PLC, a leading full-service global market research company, conducts the survey for MEP. Founded in 1946, Synovate is one of the top ten global custom marketing research companies. With substantial survey experience, global presence, and over 5,500 employees, they bring the most modern survey-related technology to the project. Synovate provides services to many companies, including General Motors, Fidelity Investments, American Express, ExxonMobil, Proctor & Gamble, State Farm Insurance, Bristol-Meyers Squibb, Kaiser Permanente and AT&T.

Synovate conducts the survey quarterly and MEP clients are interviewed annually. The survey asks clients to consider the entire set of projects or services provided by a center over the last three years and to report on how their company's performance and processes have been affected in the last 12 months. The survey asks clients to report on the impact of MEP services in the following areas:

- Intermediate outcomes in areas such as internal operations and processes, sales and marketing, human resources, information and management systems;
- Bottom-line client outcomes and impacts such as productivity improvements, sales, technology, capital investment and cost savings; and,
- Client satisfaction with the services provided.

The survey has 21 questions and takes, on average, 10-12 minutes to complete. A copy of the survey form and the questions is included in Appendix 3.

Clients are selected for the survey based on when the firm completed its first project with a center and are surveyed approximately 12 months later. For instance, if a client's project closed in March 2005, this client would be surveyed in the first quarter of 2006. Clients completing multiple projects with a center in a year are surveyed only once a year based on the date when they completed for their first project. While clients are selected based on when a project was completed with a center, the survey is client-based rather than project-based.

MEP and Synovate use several tools and techniques to minimize both response and non-response bias to the survey. Response bias may arise because of inaccurate responses to particular questions; non-response bias may arise due to errors because of an unrepresentative sample of MEP clients actually being surveyed. This might occur because some clients decline to participate or cannot be reached during the four week survey period.

Several steps are taken to limit response bias. This includes informing the clients that they were selected for an interview and encouraging their participation in the study. A letter is sent to each client announcing that they have been selected for the survey and that Synovate will be contacting them shortly to determine their experience and the outcomes of their work with a center. The MEP centers also follow up with non-respondents during the survey period to encourage their participation. In addition, interview procedures include many "call attempts" to reach a client to complete an interview. This involves calling at

different times and different days, and setting survey appointments with clients who request it.

Additional steps are undertaken to limit non-response bias. All interviewers use the same survey instruments and have written references for questions that may arise in the course of an interview. The survey uses Computer Assisted Telephone Interviewing (CATI) procedures. This requires scripting how each question is asked to ensure comparability from interviewer to interviewer and from MEP client to MEP client.

Interviewer training is conducted before each survey to review the procedures, questions, terms, definitions and the purpose and goals of the study. MEP and Synovate regularly monitors the interviews. In addition to completing the survey through a phone interview, clients have the option of completing the survey via the Internet or through an Interactive Voice Response (IVR) system, both of which exactly follow the CATI telephone script. For the surveys conducted in FY 2005, 67 percent were completed via the Internet, 30.5 percent via CATI and 2.5 percent using the IVR option. There is also a capability to conduct CATI surveys in Spanish at the client's request.

Table 1 shows the number of interviews conducted in each survey period, the number that completed an interview, and the response rate.<sup>3</sup>

<sup>3</sup> Appendix 1 explored the characteristics of the clients that responded to the survey and those that did not to examine if there are indications of potential response bias. Appendix 2 examines the confidence intervals for the survey results. Appendix 3 provides a copy of the actual survey instrument and the results for each question based on the client responses.

**Table 1****Distribution of Interviews by Survey Period and Response Rates**

Survey Period	Number of Clients Attempted	Number of Completed Interviews	Survey Response Rate
Jan. 17 – Feb. 14, 2006	1,195	1,062	88.9%
April 17 – May 14, 2006	1,283	1,123	87.5%
July 17, – Aug. 14, 2006	1,531	1,377	89.9%
Oct. 17 – Nov. 14, 2006	1,252	1,164	93.0%
<b>Total</b>	<b>5,261</b>	<b>4,726</b>	<b>89.8%</b>

**III. CLIENT IMPACT SURVEY RESULTS****A. Bottom - Line MEP Client Impact Results**

The program delivers measurable results to its clients. The services provided lead to improvements in client productivity, competitiveness, and their bottom line. Table 2 provides additional detail on productivity and competitiveness improvements reported by MEP clients. Tables 3 through 6 provide more detail on the bottom-line impacts reported by the 4,726 MEP clients interviewed.

After receiving services:

- **MEP clients improved their productivity and increased their economic competitiveness.** Over 80 percent of clients responding to the survey reported a productivity improvement and nearly 84 percent of the respondents said their company was more competitive because of the services they received in FY 2005. More than 61 percent improved profit margins, nearly 58 percent increased their revenue or cash flow, and 42 percent

increased their market share. Just over 55 percent of the clients said that their sales per employee were higher than they would have been without the MEP services (*See Table 2*).

**Table 2****Competitiveness Improvements Reported by MEP Clients (*n*=4,726 clients)**

Measure	Percent of Clients Reporting
Improved Productivity	80.3%
Improved Competitiveness	84.1%
Improved Profit Margin	61.6%
Increased Revenue or Cash Flow	57.5%
Increased Market Share	42.0%
Higher Sales per Employee	55.2%

- **MEP services had a significant impact on company sales.** As a result of the services provided, nearly 58 percent of MEP clients reported either increased sales or retained sales. Forty-four percent reported new sales revenue and well over half of the clients reported retained sales. In total, these companies reported that MEP services resulted in over \$6.2 billion in sales impact, more than \$2.8 billion in increased sales and more than \$3.4 billion in retained sales during FY 2005 (*See Table 3*).

**Table 3****Sales Impacts Reported by MEP Clients (*n*=4,726 clients)**

Sales Impact	Percent of Clients Reporting	Total Impacts Reported
Increased Sales	44.3%	\$2.84 billion
Retained Sales	54.2%	\$3.41 billion

- **MEP clients created and retained jobs as result of services.** MEP services led to just nearly 54 percent of the clients surveyed in FY 2005 to generate new jobs or retain jobs that would have otherwise been lost. Of those, almost 49 percent reported retained jobs and more than 38 percent of clients reported the creation of new jobs. Overall, MEP clients created and retained 53,219 jobs (*See Table 4*).

**Table 4**

**Employment Impacts Reported by MEP Clients**  
(*n=4,726 clients*)

Employment Impact	Percent of Clients Reporting	Total Impacts Reported
Creation of New Jobs	38.5%	17,453 jobs
Retention of Jobs	48.5%	35,766 jobs

- **MEP Clients' reported significant cost savings.** About three quarters of MEP clients surveyed said that the services resulted in cost savings in areas such as labor, materials, inventory, energy and investments and to avoid unnecessary investments. MEP clients realized over \$1.3 billion in total cost savings in FY 2005 (*See Table 5*).

**Table 5**

**Cost Savings Impacts Reported by MEP Clients**  
(*n=4,726 clients*)

Cost Savings Impact	Percent of Clients Reporting	Total Impacts Reported
Labor, material, overhead, inventory, energy, etc.	73.6%	\$840.3 million
Cost Savings on Investments Made or Avoided	43.8%	\$463.8 million

- **MEP services leveraged significant new client investment.** Nearly eight in ten (79.7 percent) clients reported that they increased investment in some key area of their operations. MEP services leveraged significant new investments among its clients, totaling over \$2.2 billion. The bulk of new investments reported by clients were in plant and equipment; but an increasing share of the new investment reported by clients was in more intangible areas such as employee skills, information systems, and research and development. New investments of over \$1.84 billion were made in plant and equipment, over \$120 million of new investment in information systems and software, and over \$140 million in workforce training and work force practices. Nearly \$146 million in new investments were made in other areas including research and development (*See Table 6*).

**Table 6**

**Investment Impacts Reported by MEP Clients**  
(*n=4,726 clients*)

New Investment Impact	Percent of Clients Reporting	Total Impacts Reported
Plant and Equipment	47.3%	\$1.84 billion
Information systems and software	30.0%	\$120.6 million
Workforce practices and employee skills	67.0%	\$140.4 million
Other areas of business	20.1%	\$145.9 million

**B. Intermediate Client Impacts**

This section focuses on the intermediate outcomes reported by MEP clients. The program makes it possible for firms to increase their agility, saving them time and money, and contributing to important improvements in product quality, workplace practices, information systems and improving the efficiency and effectiveness of their internal operations. These

improvements are also key drivers of productivity growth.

- **Almost all clients reported important business performance improvements.** Over 94 percent of the clients responding to the survey reported that one or more key business performance metrics improved as a result of MEP services, including improvements in areas such as profitability, productivity, sales, cost savings, investment, or jobs.
- **Most clients report that services led them to take improvements they would not have otherwise taken and to take actions more quickly.** Seventy-eight percent of the clients surveyed reported that the services led them to take actions that they would not otherwise have taken. Over 87 percent of the clients reported that they took actions more quickly. Also, over three quarters (77.4 percent) of the clients reported that they took actions at a lower cost.
- **MEP Clients reported important improvements in manufacturing systems.** Product quality and time to market represent key competitive edges for many manufacturers. More than half of the clients reported that the services improved product quality and over 58 percent reduced lead-time. Additionally, over half reduced their work-in-process inventory and over 47 percent increased inventory turns.
- **MEP clients are increasing their understanding of their market and have better sales opportunities.** Marketplace knowledge is essential to a company's sales. Nearly six in ten clients (58 percent) reported they have improved their customer development or retention as a result of the MEP services. More than half of the clients said they have a better understanding of their customers, markets, or competitors, and over 40 percent were able to enter new or better markets.
- **MEP clients report important improvements in human capital and workplace practices.** Improving employee skills and adopting new workplace practices are important foundations for productivity growth. Nearly 78 percent of the clients

reported that employee skills improved because of the services provided and 73 percent of the clients said that the work environment for employees improved. Nearly one out of three of the clients responding reported that MEP services helped them reduce employee turnover.

- **MEP is helping its clients better manage and use their information systems.** Investing in and improving how information technology is deployed is important in many industries and firms. Over 31 percent of the respondents reported that the services helped them better integrate their information systems with either customers or suppliers. Over 32 percent of those surveyed reported that their use or selection of information systems or technology improved as a result of MEP services and almost one in five improved their e-commerce capabilities.
- **MEP clients report that MEP services have improved their management systems.** Improving management systems, such as better planning and improved environmental and quality systems are important to firm performance. Over 65 percent of the clients reported improvements in their business and strategic planning. Additionally, almost 22 percent achieved quality certifications while over one in five improved their environmental management systems.
- **MEP clients are very satisfied with the services provided and they would use these services again.** More than 94 percent of the clients were very satisfied or satisfied with the quality of services they received from MEP and more than 91 percent definitely or probably would use these services again in the future.

#### IV. CONCLUSION

MEP focuses on results and outcomes. It maintains its accountability to its clients and investors by asking the people with the best information - its clients - about the impacts of its work. MEP delivers measurable results to its clients and its investors. Each year, MEP makes it possible for thousands of companies to solve

problems, to increase productivity, to achieve higher profits, to find new markets, to adopt technology, and to create and retain thousands of jobs. In FY 2005, MEP clients reported that these services led to:

- Improving productivity among more than eight in ten (80.3 percent) MEP clients
- Creating and retaining over 53,000 jobs
- Increasing and retaining sales of over \$6.2 billion
- Modernizing their small businesses by leveraging over \$2.2 billion in new private sector investments
- Saving more than \$1.3 billion in costs
- Increased competitiveness for more than 86% of the respondents

Other studies demonstrate that MEP services contribute to improving the performance of its clients by increasing their competitiveness, boosting their productivity, generating bottom line benefits and producing a positive return on the public investment.<sup>4</sup> The Center for Economic Studies at the U.S. Census Bureau found that MEP clients achieved an average of 5.2 percent higher productivity growth between 1996

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<sup>4</sup> See, for instance, U.S. Census Bureau, Center for Economic Studies, *The Impact of MEP on Manufacturing Plant Performance*, Draft, June 2001; Ronald S. Jarmin, "Evaluating the Impact of Manufacturing Extension on Productivity Growth," (1999), *Journal of Policy Analysis and Management*, Volume 18, No.1 pp.99-119 and Nexus Associates, *NIST MEP Program: Impact on the U.S. Economy in 2000* November 2, 2001.

and 1997 than non-clients and experienced 4.7% faster employment growth over the same period.<sup>5</sup>

MEP generates a positive return on its investment. MEP client outcomes translate into broader economic effects as well.<sup>6</sup> Gross Domestic Product in 2000 was \$7.6 billion higher than without the program, personal income was \$4.8 billion higher than without the program and employment was 114,000 higher. MEP services increase corporate and personal tax revenues both by significantly growing before-tax profits of small manufacturers and by stabilizing or growing the manufacturing workforce. A 2004 study estimates the MEP program's return on investment of the Federal budget investment at more than a 6:1 return to the federal treasury.<sup>7</sup>

The results from these studies reinforce and complement these survey findings. The survey data and these other studies continue to show that the program has a positive impact on the companies it serves and makes a positive contribution to local, state, and the U.S. economy.

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<sup>5</sup> U.S. Census Bureau, Center for Economic Studies, *The Impact of MEP on Mfg Plant Performance*, Draft, 1999.

<sup>6</sup> The discussion about the broader economic impacts and the estimates of the return to the federal treasury are drawn from the following study: Nexus Associates. *NIST MEP Program: Impact on the U.S. Economy in 2000*. November 2, 2001.

<sup>7</sup> NIST, Building and Fire Research Laboratory, Office of Applied Economics. *Estimate of National Economic Losses from the FY2004 MEP Budget Cuts*. May 5, 2004.

## APPENDIX 1: Characteristics of Respondents and Non-respondents

This appendix explores the characteristics of the population selected for survey and examines whether there were important differences among those that responded to the survey and those that did not respond to the survey. The data in this report are from a representative cross-section of MEP clients in FY 2005. Those responding to the survey did not significantly differ from the larger population of all MEP clients that we tried to contact but who did not respond. Thus, the data reported in this report is representative of the target population and represents a conservative and reasonable estimate of MEP program impacts based on client responses. The data reported

here represent actual responses from the clients. Data have not been weighted nor have missing data been imputed.

Clients responding were likely to have completed more projects, involving more hours, and were smaller (as measured by employment) than non-respondents. The typical respondent completed 2.7 projects, representing 185 hours of substantive activity and had 183 employees. The typical non-respondent completed 2.1 projects, representing 120 hours of substantive activity and had 186 employees. Below is additional information regarding the characteristics and distribution of the survey respondents compared to non-respondents.

**Appendix Table 1.1**

### Characteristics of Survey Respondents & Non-Respondents in Terms of Establishment Size Category

Employment Size Category	Survey Respondents ( <i>n</i> =4,726)	Survey Non-respondents ( <i>n</i> =535)
0-19 employees ( <i>n</i> =1,253)	23.6%	26.0%
20-99 employees ( <i>n</i> =1,975)	38.0%	33.3%
100-249 employees ( <i>n</i> =1,118)	21.1%	22.4%
250-499 employees ( <i>n</i> =529)	10.0%	10.3%
At least 500 employees ( <i>n</i> =386)	7.3%	8.0%
Total Population ( <i>N</i> =5,261)	100.0%	100.0%

As this table suggests, the portion of clients responding to the survey closely tracks the distribution of the total population. Smaller clients (i.e., those with less than 100 employees) were slightly more likely to respond to the survey as compared to larger clients (those with 100 or more employees).

**Appendix Table 1.2****Characteristics of Survey Respondents & Non-Respondents in Terms of Completed Projects**

Number of Projects Completed	Survey Respondents ( <i>n</i> =4,726)	Survey Non-respondents ( <i>n</i> =535)
1 Project ( <i>n</i> =2,141)	39.1%	54.7%
2 Projects ( <i>n</i> =1,114)	21.4%	19.1%
3 or more Projects ( <i>n</i> =2,401)	39.5%	26.2%
Total Population ( <i>N</i> =5,261)	100.0%	100.0%

There appears to be a positive relationship between the number of projects completed with a client and the probability of responding to the survey. This table

suggests that clients having only one project with a center were less likely to respond to the survey and those clients with two or more projects.

**Appendix Table 1.3****Characteristics of Survey Respondents & Non-Respondents in Terms of Project Length**

Project Length	Survey Respondents ( <i>n</i> =4,726)	Survey Non-respondents ( <i>n</i> =535)
1-16 hours ( <i>n</i> =863)	15.8%	21.9%
17-40 hours ( <i>n</i> =965)	17.5%	25.4%
41-80 hours ( <i>n</i> =904)	17.2%	17.4%
81-120 hours ( <i>n</i> =556)	10.6%	9.9%
More than 120 hours ( <i>n</i> =1,973)	38.9%	25.4%
Total Population ( <i>N</i> =5,261)	100.0%	100.0%

Paralleling the results above, there also appears to be a direct relationship between the overall length of all projects completed and the likelihood of responding to the survey. Clients with higher levels of involvement

with a center were more likely to respond to the survey compared to those that had shorter periods of involvement with a center.

## APPENDIX 2: Standard Error of the Estimates

All sampling approaches involve the possibility that the results reported could be different from the characteristics of the full population from which the sample is drawn. While the survey is not a sample, not all clients respond to the survey, so it is important to determine and report the confidence intervals of the survey results. The likelihood that there is a range in the estimates depends on two factors: 1) the size of the sample, and 2) the observed distribution of the results in the sample. As to sample size, a sample of 50 is generally regarded as the minimum necessary. As to the observed distribution, the closer to a 50-50 split that exists in the sample, the greater the likelihood that the sample result and the population result will diverge. Because of the large sample size, the confidence intervals around each reported result are very narrow.

To express the degree of confidence in the results relying on a sample, statisticians compute a “standard error of the estimate” and a “confidence interval” for the results. The confidence interval expresses the range on either side of an observed sample result that can be expected for the true value of the overall population to fall. The greater the degree of confidence wanted, the wider the confidence interval will be. Statisticians generally use a 95 percent confidence interval. This means that we are 95 percent confident that the true population proportion is in the specified range of the proportion reported based on the sample size.

The table below reports the confidence intervals for the full sample. This table provides the estimates of the standard errors at the 95 percent confidence level. Overall, we are 95 percent certain that the true population proportion ranges between  $\pm 0.03$  percent to  $\pm 1.38$  percent of the observed proportion. This means, for example, that if 60 percent of the respondents reported that the services helped them achieve some cost savings, there is a 95 percent probability that the true value for the entire population of MEP clients would fall between 58.6 percent and 61.4 percent.

**Appendix Table 2.1**

**Standard Errors of Estimates for Given Survey Results, 95-Percent Confidence Level, Sample Size of 4,726 Respondents**

Reported Result (Percent)	Confidence Interval
1	$\pm 0.03$
10	$\pm 0.9$
20	$\pm 1.2$
30	$\pm 1.3$
40	$\pm 1.4$
50	$\pm 1.4$
60	$\pm 1.4$
70	$\pm 1.3$
80	$\pm 1.2$
90	$\pm 0.9$
99	$\pm 0.03$

**APPENDIX 3: Client Impact Survey –  
FY 2005 National Results**

*(n=4,726 respondents)*

1. Did the services you received lead you to:

- Take actions that you would otherwise not have taken?  
Yes – 80.8%  
No – 19.2%
- Take actions more quickly?  
Yes – 87.3%  
No – 12.7%
- Take actions at lower cost?  
Yes – 77.4%  
No – 22.6%

2. As a direct result of services you received, has your establishment experienced any of the following changes over the past 12 months in these areas of manufacturing systems?

- Reduced lead time  
Yes – 58.8%  
No – 41.2%
- Reduced work in process inventory  
Yes – 53.1%  
No – 46.9%
- Reduced defect rate  
Yes – 53.0%  
No – 47.0%
- Increased inventory turns  
Yes – 47.5%  
No – 52.5%

3. As a direct result of services you received, has your establishment experienced any of the following changes over the past 12 months in these areas of marketing and sales?

- Improved understanding of customers, markets, or competitors  
Yes – 51.0%  
No – 49.0%
- Improved customer development or retention  
Yes – 58.0%  
No – 42.0%
- Entry into new or better markets  
Yes – 40.5%  
No – 59.5%

4. As a direct result of services you received, has your establishment experienced any of the following changes over the past 12 months in these areas of human resources?

- Improved employee skills  
Yes – 77.6%  
No – 22.4%
- Reduced employee turnover  
Yes – 32.8%  
No – 67.2%
- Improved work environment for employees  
Yes – 72.6%  
No – 27.4%

5. As a direct result of services you received, has your establishment experienced any of the following changes over the past 12 months in these areas of information systems?

- Achieved greater integration with the information systems of your customers or suppliers  
Yes – 31.4%  
No – 68.6%
- Improved e-commerce capacity  
Yes – 18.9%  
No – 81.1%
- Improved use or selection of information systems or software  
Yes – 32.5%  
No – 67.5%

6. As a direct result of services you received, has your establishment experienced any of the following changes over the past 12 months in these areas of management systems?

- Improved environmental management systems (e.g., ISO 14000)  
Yes – 20.2%  
No – 79.8%
- Achieved quality certification (e.g., QS 9000, ISO 9000)  
Yes – 21.9%  
No – 78.1%
- Improved business or strategic planning  
Yes – 65.4%  
No – 34.6%

7. As a direct result of services you received, has your establishment experienced any of the following changes over the past 12 months in these areas of overall performance?

- Improved profit margin  
Yes – 61.6%  
No – 38.4%
- Increased revenue or cash flow  
Yes – 57.5%  
No – 42.5%
- Improved customer satisfaction  
Yes – 72.0%  
No – 28.0%
- Increased market share  
Yes – 42.0%  
No – 58.0%

8. Did the services you received directly lead to an increase in sales at your establishment over the past 12 months?

- Yes – 44.3%
- No – 55.7%  
How much? \$2,842,920,128

9. Did the services you received directly lead you to create any jobs over the past 12 months?

- Yes – 38.5%
- No – 61.5%  
How many? 17,453

10. Did the services you received directly lead you to retain sales that would have otherwise been lost?

- Yes – 54.2%
- No – 45.8%  
How much? \$3,408,922,915

11. Did the services you received lead you to retain any jobs over the past 12 months?

- Yes – 48.5%
- No – 51.5%  
How many? 35,766

12. Did the services you received directly result in cost savings in labor, materials, energy, overhead, or other areas over what would otherwise have been spent in the past 12 months?

- Yes – 73.6%
- No – 26.4%  
How much? \$840,338,144

13. Over the past 12 months, were sales per employee higher than they would have been without services?

- Yes – 55.2%
- No – 44.8%

14. As a result of the services you received, has your establishment increased its investment over the past 12 months in:

- Plant or equipment?  
Yes – 47.3%  
No – 52.7%  
How much? \$1,840,946,975
- Information systems or software?  
Yes – 30.0%  
No – 70.0%  
How much? \$120,659,338
- Workforce practices or employee skills?  
Yes – 67.0%  
No – 33.0%  
How much? \$140,459,685
- Other areas of business?  
Yes – 20.1%  
No – 79.9%  
How much? \$145,998,954

15. As a result of the services you received, did your establishment avoid any unnecessary investments?

- Yes – 39.9%
- No – 60.1%  
How much was saved? \$319,731,106

16. As a result of the services you received, did your establishment save on any investments that were made?

- Yes – 28.5%
- No – 71.5%  
How much was saved? \$144,100,214

17. Is your establishment more competitive as a result of the services you received?

- Yes – 86.9%
- No – 13.1%

18. Did the services you received have any other effects on your establishment during the past 12 months?

- Yes – 57.5% Describe them.

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- No – 42.5

19. Are you satisfied with the quality of services you received?

- Very Satisfied 66.8%
- Satisfied 27.8%
- Neutral 4.4%
- Dissatisfied 0.6%
- Very Dissatisfied 0.4%

20. Would you use this program's services again in the future?

- Definitely Would 67.7%
- Probably Would 23.9%
- Not Sure 6.2%
- Probably Would Not 1.7%
- Definitely Would Not 0.5%

21. What do you think will be your single biggest business challenge next year?

- Cost/Pricing Pressures 26.7%
- Sales/Marketing Issues 26.1%
- Operations Management 17.5%
- Human Resources/skills/training 17.5%
- Management & Planning 13.9%
- Competition (Foreign/Domestic) 6.4%
- Developing/Improving products 6.1%
- Finance/Capital 4.1%
- Service/Customer Service 3.0%
- Technology Concerns 2.0%
- Government Regulations 1.5%